~~METHOD AND ARRANGEMENT FOR AUTOMATICALLY TRANSLATING MESSAGES IN A COMMUNICATION SYSTEM~~

The Siemens product guide "ISDN in the Office" (special edition telecom report and Siemens Magazine *COM*; ISBN 3-8009-3849-9, pp 58-66) teaches a private communication system that makes additional functions available, besides switching-related functions. Such additional functions are generally referred to as performance features; a large number of different performance features are known for the communication service "voice".

With the increasing internationalization of telephone traffic, the number of connections between telephone subscribers who speak different languages is growing. In the course of this development, it is known that efforts have been made to facilitate understanding between telephone subscribers who speak different languages by inserting a translating device.

EP 0 585 480 A1 teaches a method in which translation devices are looped in between two subscriber terminal devices participating in a conference connection, ~~respectively.~~ To loop in a translation device, it is necessary to input additional information into one or more subscriber terminal ~~devices~~ participating in the conference connection.

The information that triggers the loop-in of the translation device is inputted upon request either by selecting a call number at the respective subscriber terminal device or by voice sampling in the language in which the respective conference subscriber wants to conduct the subsequent conversation in the context of the conference connection; that is, wants to speak and hear.

It is ~~the~~ object of the present invention to set forth a method and ~~an arrangement~~ which affords a higher level of convenience in a connection between subscribers of different native languages.

~~This object is inventively achieved in accordance with the features of patent claim 1~~ or 8, respectively.

An essential advantage of the inventive method is that a subscriber can communication in his native language without additionally inputting information.

Advantageous developments ~~of the~~ invention are set forth in the subclaims.

~~An exemplifying embodiment of the invention is detailed below with the aid of the drawing.~~

~~Shown are:~~

Figure 1 a structural diagram ~~of the schematic~~ of a communication system for carrying out the inventive method;

Figure 2 a structural diagram of the ~~schematic~~ of the functional units participating in the context of a connection set-up between subscribers.

Figure 1 depicts essential functional elements of a communication system with the aid of a structural diagram. The depicted communication system consists of a system center PBX with a control unit CC which is connected to terminal units LTU1, LTU2, ..., LTUn and to a switching matrix array SN.

The terminal units LTU1, LTU2, ..., LTUn contain subscriber-oriented device terminals, such as ISDN base terminals for digital monofunctional and multifunctional

terminal devices, 1-channel terminal modules for terminal devices such as digital voice terminal devices and network terminal devices, and subscriber terminals for analog voice terminal devices and fax terminal devices. ~~The~~ Figure 1 ~~exemplarily~~ depicts an internal fax terminal device FAX1 as well as a digital voice terminal device T1 and a multifunctional terminal device M1, which respectively include ~~comprise~~ a dialog operator interface DBO.

The terminal units LTU1, LTU2,..., LTUn contain line set circuits that serve for connecting to public and/or private networks, or respectively, to special equipment. These include ISDN base terminals for ISDN office traffic (office lines AL1, AL2,..., Aln) and ISDN cross traffic (2 channels at 64 kBit/s and ISDN signaling) as well as digital interface units; that is, multiplex terminals (30 channels at 64 kBit/s each) with the operating modes of office traffic and cross traffic with ISDN signaling, and cross traffic with channel-associated signaling.

The terminal units LTU1, LTU2, ..., LTUn are connected to the switching matrix array SN via four voice data multiplexing channels, for example. The message exchange between the terminal units LTU1, LTU2, ..., LTUn and the controller CC is accomplished via a signaling channel (referenced HDLC in the Figure) in the known HDLC point-to-multipoint method.

The switching matrix array SN is preferably modularly constructed and consists of a timer for 16-voice-data multiplex channels [sic] with no blocking. The connecting of two such base modules produces a coupling stage for 1024 time layers (32 multiplex channels for every 32 channels). Besides 1-channel connections, broadband connections ~~can~~ can also be produced.

The control unit CC consists of a data processor DP, a processor for signal control DCL, a clock generator PCG and a database DB. These components are connected to

one another via a system bus SB, as is illustrated in ~~the~~ Figure 1. The database DB contains a text memory ROM and a selector memory RAM, whereby display texts for a dialog operator interface DBO of internal terminal devices are stored in the text memory ROM in several languages. By pressing a language selection button (not illustrated) at the terminal device (FAX1, T1, M1), the dialog operator interface DBO can be switched to another available language. The language that was set at the terminal device (FAX1, T1, M1) is stored as selector information in the selector memory RAM, either temporarily until the end of the next conversation, or statically until the next language selection by the user.

A voice information server VMS and a text and fax server TFS are connected to the previously described components via a system bus SB.

The voice information server VMS offers the connected subscribers the ability to reroute their telephone connection to personal "voice mailboxes". The incoming voice information is then stored in the mailboxes in digitized form and reproduced in natural language in the output.

By means of the text and fax server TFS, incoming text or fax messages are filed in a person-related text or fax mailbox, ~~said~~ such messages being outputted upon polling by the user.

Via the switching matrix array SN, voice translation devices TRSS1,...,TRSSn and text translation devices TRTT1,...,TRTTn are connected to the communication system. The translators TRTT,TRSS are connected to the system bus SB for control purposes, as illustrated in the Figure 1.

The voice translators TRSS1,...,TRSSn serve for translating a spoken message from a source language into a desired target language, and vice versa. For example, by

means of the voice translator TRSS1, it is possible to translate a German message into an English message, and vice versa. The devices used as voice translators TRSS1,...,TRSSn are like those used in the European patent application 585 480, for example.

The text translators TRTT1...TRTTn serve for translating a text that is written in a source language into a desired target language. By means of the text translator TRTT1, a German text can be translated into an English text. The devices used as text translators TRTT1,...TRTTn are like those used in the European patent application 357 370.

Figure 2 schematically depicts a communication system KFK-A with a calling terminal device EG-A allocated thereto, on one hand, and a communication system KS-B with a called terminal device EG-B allocated thereto, on the other hand. For the sake of simplifying the description, it is assumed that both communication systems KS-A, KS-B are constructed as is described in connection with Figure 1.

In a data base DB-A of the communication system KS-A, selector information SI is filed in a selector memory RAM, which information identifies the language that is set for a display operator interface DBO of internal terminal devices EG. Thus, for example, selector information SI-A is filed in the selector memory RAM for the illustrated calling terminal device EG-A.

In the same way, selector information SI is filed in a database DB-B of the communication system KS-B in a selector memory RAM, which information identifies the language that is set for a display operator interface DBO of internal terminal devices EG. Thus, for the illustrated called terminal device EG-B, selector information SI-B is filed in the selector memory RAM. In the depicted configuration, the language for the display operator interface DBO of the calling terminal device EG-

A is German D; for the display operator interface DBO of the called terminal device EG-B, the language is English E.

In a connection set-up from the calling terminal device EG-A to the called terminal device EG-B, in addition to the customary subscriber data (e.g. name of the subscriber making the call and call number of the subscriber's station), the selector information SI-A that is allocated to the calling terminal device is transmitted to the communication system KS-B in the context of a call signaling message SETUP.

The following refers in part to Figure 1.

With the aid of the transmitted selector information SI-A, the communication system KS_B identifies the language that is set for the calling terminal device EG-A, henceforth referred to as source language. By means of the selector information SI-B, the communication system KS-B identifies the native language that is set for the called terminal device EG-B, henceforth referred to as target langauge. If the selector information SI-A differs from the selector information SI-B, then the connection is automatically led via a translator TRSS, TRTT, which translates a message from the source language into the target language.

If the terminal devices EG-A, EG-B are a matter of digital voice terminal devices between which there is a connection for transmitting spoken messages, then a message coming in at the communication system KS-B is forwarded via the switching matrix array SN and the line c to the voice translator TRSS1, which translates the incoming message from the source language (e.g. German) into the target language (e.g. English) and transfers the translated message to the called terminal device EG-B via the line d and the switching matrix array SN. Messages that are to be subsequently transmitted from the called terminal device EG-B to the calling terminal device EG-A are forwarded via the switching matrix array SN and the line d to the voice translator

TRSS1, which translates the message from English into German and transfers the translated message to the calling terminal device EG-A via the line c and the switching matrix array SN.

If the called terminal device EG-B is unavailable at the time of the connection set-up, a spoken message is stored together with the transmitted selector information SI-A in a personal voice mailbox, from which the message is outputted upon request by the receiver. The message is forwarded via the switching matrix array SN and the line c to the voice translator TRSS1, which translates the message form the source language German into the target language English and transmits the translated message to the called terminal device EG-B via the line d and the switching matrix array SN.

If the terminal devices EG-A, EG-B are fax terminal devices, for example, between which there is a data connection for transmitting fax messages, then the text portions of a fax message arriving at the communication system KS-B are converted into a text format in the source language with the aid of a character detector (optical character reading) that is known per se, which is not illustrated. The message is then forwarded via the switching matrix array and the line a to the text translator TRTT1, which translates the text from the source language German into the target language English and transfers the translated massage via the line b and the switching matrix array SN to the called terminal device EG-B.

If the called terminal device EG-B is unavailable at the time of the connection set-up, the fax message is stored in a personal fax mailbox together with the transmitted selector information SI-A. Upon polling by the receiver, the stored message is translated and transmitted to the called terminal device EG-B as described.

When the terminal devices EG-A, EG-B are multifunctional devices, for example, between which there is a data connection for transmitting electronic mail, the message

that is to be translated is forwarded via the switching matrix array SN and the line a to the text translator TRTT1, which translates the message from the source language German into the target language English and transfers the translated message to the called terminal device EG-B via the line b and the switching matrix array SN. If the called terminal device EG-B is unavailable at the time of the connection set-up, an arriving message is stored in a personal text mailbox together with the transmitted selector information SI-A. Upon polling by the receiver, the stored message is translated by the text translator TRTT1 and transferred to the called terminal device EG-B as described.

The user has the option of deactivating the automatic translation. In a voice terminal device, a corresponding menu for the display operator interface DBO is offered for this purpose, in which menu the user can accept or decline the offered translation before activating the translation. For a device with a screen, this option is integrated into the monitor interface that is used in the various services (e.g. a fax service).

It is provided in the context of the present invention that the translation of a message is not performed exclusively by the communication system KS-B to which the called terminal device EG-B is allocated. If the communication system KS-B does not have at its disposal a suitable translator TRSS, TRTT which realizes a translation of a message from the source language into a desired target language, or if the translator TRSS, TRTT is not available, then the translation ~~can~~ can also be performed by the communication system KS-A to which the calling terminal device EG-A is allocated.

Furthermore, it is possible that only calls coming in at the communication system KS-B are translated from the source language into the target language. Messages that are transferred from the called terminal device EG-B to the calling terminal device EG-A are then translated from the target language into the source language by the communication system KS-A.

It ~~is~~ also provided in the context of the invention that an automatic translation of a message is ~~also~~ performed in the context of multimedia service changeovers, such as text-to-voice or voice-to-text.